WHAT IS CLAIMED IS:

1. A method of making a semiconductor device comprising:

forming a first in-situ doped silicon layer over a substrate material in a pressure vessel while introducing a precursor gas;

without removing the substrate material from the pressure vessel, discontinuing introduction of the precursor gas and forming an undoped silicon capping layer on and in contact with the doped silicon layer; and

removing the undoped silicon capping layer.

2. The method of claim 1 wherein the undoped silicon capping layer is removed by CMP.

3. The method of claim 1 further comprising, after the step of removing the undoped silicon capping layer, depositing a second in-situ doped silicon layer.

4. The method of claim 3 wherein the first doped layer is formed with an n-type dopant or a p-type dopant, and the second doped layer is formed with a p-type dopant or an n-type dopant, the type of the second layer opposite the type of the first doped layer.

5. The method of claim 3 wherein the doped layers form a portion of a memory device.

6. The method of claim 5 wherein the memory device forms a portion of a three dimensional memory array.

7. A method of conditioning a pressure vessel to prevent autodoping, the method comprising the steps of:

forming a first doped silicon layer in the pressure vessel over a surface of a first wafer while introducing a precursor gas;

without removing the first wafer from the pressure vessel, discontinuing introduction of the precursor gas and forming an undoped silicon capping layer on and in contact with the first doped silicon layer and on exposed surfaces in the pressure vessel; and

introducing a second wafer into the pressure vessel after formation of the undoped capping layer and forming a second silicon layer over a surface of the second wafer, wherein the thickness of the undoped capping layer is sufficient to reduce autodoping in the second silicon layer to approximately a background level.

8. The method of claim 7 wherein the undoped silicon capping layer, when formation is complete, is thinner than the first doped layer.

9. The method of claim 8 wherein the thickness of the undoped silicon capping layer is about 500 angstroms or less.

10. The method of claim 8 wherein the thickness of the undoped silicon capping layer is between about 500 angstroms or and about 200 angstroms.

11. The method of claim 7 wherein the second silicon layer is undoped.

12. The method of claim 7 wherein the first doped layer is formed with an n-type dopant or a p-type dopant, and the second layer is formed with a p-type dopant or an n-type dopant, the type of the second layer opposite the type of the first doped layer.

13. The method of claim 7 wherein the first or the second silicon layer forms a portion of a memory device.

14. The method of claim 13 wherein the memory device forms a portion of a three dimensional memory array.

15. A method of making a silicon-based electronic device comprising the steps of:

forming a first doped silicon layer in a pressure vessel over a surface of a product wafer substrate material while introducing a precursor gas;

without removing the substrate material from the pressure vessel, discontinuing introduction of the precursor gas and forming an undoped silicon capping layer on and in contact with the first doped silicon layer; and

forming a second doped silicon layer on and in contact with the undoped silicon capping layer, wherein the layers form a portion of a memory device.

16. The method of claim 15 wherein the memory device is a portion of a three dimensional memory array.

17. The method of claim 16 wherein the undoped capping layer when formed is thinner than the first doped layer.

18. The method of claim 17 wherein the thickness of the undoped capping layer is between about 500 and about 200 angstroms.

19. The method of claim 15 wherein the first doped layer is formed with an n-type dopant or a p-type dopant, and the second doped layer is formed with a p-type dopant or an n-type dopant, the type of the second doped layer opposite the type of the first doped layer.

20. A method of making a silicon-based electronic device comprising the steps of:

forming a first doped silicon layer in a pressure vessel over a surface of a product wafer substrate material while introducing a precursor gas; and

without removing the substrate material from the pressure vessel, discontinuing introduction of the precursor gas and forming an undoped silicon capping layer on and in contact with the first doped silicon layer,

wherein the layers form a portion of a three dimensional memory array.

21. The method of claim 20 wherein the undoped capping layer is thinner than the first doped layer.

22. The method of claim 21 wherein the thickness of the undoped capping layer is between about 500 and about 200 angstroms.

23. The method of claim 20 further comprising forming a second doped layer on and in contact with the undoped capping layer.

24. The method of claim 23 wherein the first doped layer is formed with n-type or p-type dopants and the second layer is formed with n-type or p-type dopants, the type of the second layer opposite the type of the first layer.

25. A method of making a semiconductor device comprising:
forming a first in-situ doped silicon layer over a substrate material in a pressure vessel while introducing a precursor gas;
without removing the substrate material from the pressure vessel, discontinuing introduction of the precursor gas and forming an undoped silicon capping layer on the doped silicon layer; and
consuming or removing the undoped silicon capping layer, wherein the semiconductor device is a memory device.

26. The method of claim 25, wherein the undoped silicon capping layer is removed by CMP.

27. The method of claim 25, wherein the undoped silicon capping layer is reactively consumed.

28. The method of claim 25, further comprising, after the step of consuming or removing the undoped silicon capping layer, depositing a second in-situ doped silicon layer.

29. The method of claim 25, wherein the memory device is a portion of a three dimensional memory array.

30. The method of claim 25 wherein the undoped capping layer, when formed, is thinner than the first doped layer.

31. The method of claim 30 wherein the thickness of the undoped capping layer is between about 500 and about 200 angstroms.